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Conference Abstract

Low Cost Environment Monitoring Server – Wireshield

Jiri Frank‡, Lukas Belka‡

‡ National Museum, Prague, Czech Republic

Corresponding author: Jiri Frank (jiri_frank@nm.cz)

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Abstract

Just as good quality infrastructure is necessary for scientific data and collections, it is important to provide data processing and storage equipment with stable environmental conditions. In these situations, it is important to monitor conditions such as temperature, humidity, etc. In our case, a collections institution where data and especially collections are stored in many locations, we were looking for a reliable and economical solution. After an analysis of available commercial systems we decided to develop our own low cost environmental monitoring server called Wireshield. This solution has proven to have great potential for use in a wide variety of environmental monitoring situations. The Wireshield temperature monitoring prototype can be simply defined by connecting a one chip Raspberry computer with an ATmega microchip, a temperature sensor, and data interpretation. Data are collected by DS18B20 sensors connected via a 1-Wire bus. Audio cables with jack connectors are used for the data transfer between the sensors and microchip. The audio cable can be replaced by a UTP (Unshielded Twisted Pair) cable for longer distances. The ATmega microchip is connected with the Raspberry by UART (Universal Asynchronous Receiver/Transmitter) communication. The role of the Raspberry is to interpret the data by using a web server. Wireshiled also includes a TFT (Thin-film transistor) display showing the actual temperature on each sensor. The display is connected to the ATmega microchip by SPI (Serial Peripheral Interface) bus. It is possible to configure the colour of temperatures and define the limits. When the temperature limit is crossed, the Raspberry immediately sends an email notification to the user. Our prototype

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was built to monitor temperature, but it can be configured to monitor other conditions (e.g. humidity) depending on sensors and configuration.

Keywords

Environment minotoring, temperature, sensors, low cost hardware, server, data

Presenting author

Jiri Frank